

I claim:

1 1. A two-piece stent combination for facilitating retrograde supply of
2 oxygenated blood to heart tissue through a coronary sinus comprising:

3 an arterializing stent having a leading end positioned in a left ventricle and a
4 trailing end positioned in a coronary sinus, and

5 a restricting covered stent having an underlying restricting stent and a covering,
6 and having a coronary sinus end positioned in the coronary sinus, and a right atrial end,
7 and exhibiting a constriction between said coronary sinus end and said right atrial end.

1 2. The two-piece stent combination according to claim 1, wherein a cross
2 section of said restricting covered stent tapers toward said constriction.

1 3. The two-piece stent combination according to claim 1, wherein a cross
2 section of said restricting covered stent is appropriately sized to control blood flow from
3 said coronary sinus into said right atrium.

1 4. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent further exhibits a constriction along its length and a cross sectional
3 tapering toward the constriction.

1 5. The two-piece stent combination according to claim 1, wherein a cross
2 section of said arterializing stent is appropriately sized to control blood flow from said
3 left ventricle into said coronary sinus.

1 6. The two-piece stent combination according to claim 1, wherein a cross
2 section of said restricting covered stent at said constriction and a cross section of said

3 arterializing stent are appropriately sized to keep pressure inside the coronary sinus from
4 rising above about 50 mm Hg while avoiding excessive left-to-right shunting.

1 7. The two-piece stent combination according to claim 1, wherein a cross
2 section of said restricting covered stent at said constriction and a cross section of said
3 arterializing stent are appropriately sized to keep pressure inside said coronary sinus from
4 rising above about half systemic pressure.

1 8. The two-piece stent combination according to claim 1, wherein said
2 restricting covered stent and said arterializing stent allow compression to fit within a
3 delivery catheter.

1 9. The two-piece stent combination according to claim 1, wherein said
2 restricting covered stent and said arterializing stent allow expansion after delivery.

1 10. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent and said restricting covered stent are flexible.

1 11. The two-piece stent combination according to claim 1, wherein said
2 covering of said restricting covered stent is inside said underlying restricting stent.

1 12. The two-piece stent combination according to claim 1, wherein said
2 covering of said restricting covered stent is outside said underlying restricting stent.

1 13. The two-piece stent combination according to claim 1, wherein said
2 covering of said restricting covered stent partially covers said underlying restricting stent.

1 14. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent further comprises a covering.

1 15. The two-piece stent combination according to claim 14, wherein said
2 covering of said arterializing stent is inside said arterializing stent.

1 16. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent is from about 1 cm to about 4 cm in length.

1 17. The two-piece stent combination according to claim 1, wherein a cross
2 section of said arterializing stent tapers from the trailing end to the leading end.

1 18. The two-piece stent combination according to claim 17, wherein said
2 trailing end of said arterializing end is from about 4 mm to about 6 mm in diameter and
3 said leading end of said arterializing stent is from about 2 mm to about 5 mm in diameter.

1 19. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent has a constant cross section.

1 20. The two-piece stent combination according to claim 19, wherein said
2 arterializing stent is from about 1 mm to about 6 mm in diameter.

1 21. The two-piece stent combination according to claim 1, wherein said
2 restricting covered stent is from about 1 mm to about 15 mm in diameter.

1 22. The two-piece stent combination according to claim 1, wherein said
2 constriction of said restricting covered stent is from about 1 mm to about 6 mm in
3 diameter.

1 23. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent and said restricting covered stent are of mesh construction.

1 24. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent and said restricting covered stent are of coiled construction.

1 25. The two-piece stent combination according to claim 1, wherein said
2 arterializing stent and said restricting covered stent are connected.

1 26. The two-piece stent combination according to claim 1, wherein said right
2 atrial end of said restricting covered stent is positioned within the right atrium.

1 27. A method for retrogradely supplying oxygenated blood from a left
2 ventricle to heart tissue via a coronary sinus comprising:
3 puncturing a hole through said coronary sinus and a wall of said left ventricle,
4 delivering an arterializing stent through said hole, wherein a leading end is placed
5 in said left ventricle and a trailing end is placed in said coronary sinus,
6 and delivering a restricting covered stent with a coronary sinus end positioned
7 within said coronary sinus.

1 28. The method according to claim 27, wherein said arterializing stent and said
2 restricting covered stent are delivered percutaneously.

1 29. The method according to claim 27, further comprising expanding said
2 arterializing stent after delivery within the hole.

1 30. The method according to claim 27, wherein said constriction of said
2 restricting covered stent is positioned to fit approximately within a coronary ostium.

1 31. The method according to claim 27, wherein said right atrial end of said
2 restricting covered stent is positioned within a right atrium.

1 32. The method according to claim 27, wherein said constriction and said right
2 atrial end of said restricting covered stent are positioned within the coronary sinus.

33. The method according to claim 27, wherein said arterializing stent is appropriately sized to control blood flow from said left ventricle into said coronary sinus.

34. The method according to claim 27, wherein said restricting covered stent tapers toward said constriction and is appropriately sized to control blood flow from said coronary sinus into a right atrium.

35. The method according to claim 27, wherein a cross section at said constriction of said restricting covered stent and a cross section at said arterializing stent are appropriately sized to keep pressure inside the coronary sinus from rising above about 50 mm Hg while avoiding excessive left-to-right shunting.

36. The method according to claim 27, wherein a cross sectional at said constriction of said restricting covered stent and a cross section at said arterializing stent are appropriately sized to keep the pressure inside the coronary sinus from rising above about half the systemic pressure.